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PATENT ABSTRACTS OF JAPAN

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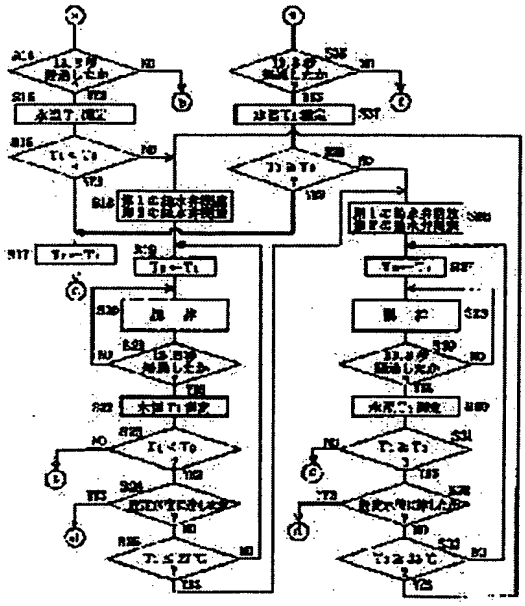
(72)Inventor : WADA MASAJI

(54) WASHING MACHINE

(57)Abstract:
PURPOSE: To correctly supply water and hot water, even when the connection of connecting hoses for supplying water and supplying hot water to a first water supply valve and a second water supply valve is reversed, in that which is provided with both those water supply valves for supplying water into a washing tank.
CONSTITUTION: When it is decided that a water temperature is varied so as to be different from a prescribed variation, as a result of detection of a water temperature in a washing tank after water is supplied and before water is supplied by selecting opening of both water supply valves, the opening selection of both the water supply valves is reversed. Also, when a water temperature in the washing tank does not become a prescribed variation even if it is executed a prescribed number of times that the opening selection of both the water supply valves is reversed, the operation is stopped or an abnormality notice is executed. Moreover, the final opening selection contents of both the water supply valves are stored, and first selection opening of both the water supply valves is executed by its stored contents by the next operation.



LEGAL STATUS

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[Date of registration]	19.01.2001
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[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	19.01.2004

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the washing machine equipped with the 1st feed valve and 2nd feed valve.
[0002]
[Description of the Prior Art] Conventionally, in the washing machine, the thing equipped with the 1st feed valve and 2nd feed valve is offered. In the case of this thing, water or a molten bath can be supplied now in laundry sink by connecting the connection hose led to the feed valve of one of these from the faucet of a waterworks, connecting to the feed valve of another side the connection hose led from the hot-water supply system, and choosing those disconnection.
[0003]
[Problem(s) to be Solved by the Invention] However, when connection of a connection hose had been made reverse in the case of an above-mentioned thing, supply of water and a molten bath became reverse and water temperature did not become high, it had the trouble of sufficient wash effectiveness not being acquired, or damaging the washing when water temperature becomes high too much.
[0004] This invention is made in view of an above-mentioned situation, therefore the purpose is in offering water and the washing machine which can perform supply of a molten bath correctly, also when connection of a connection hose has been made reverse.
[0005]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, it sets in the washing machine of this invention. While having a temperature detection means to detect the water temperature in laundry sink, disconnection of both the 1st and 2nd feed valves is chosen and performed. each the water supply before and after water supply -- when the water temperature in laundry sink is judged to have carried out predetermined change and a different change from the detection result by the above-mentioned temperature detection means, it is characterized by having the control means which makes reverse open selection of both the above-mentioned feed valves.
[0006] In this case, a control means is good to be made to carry out control which carries out halt or abnormality information for operation, when the water temperature in laundry sink does not become a predetermined change, even if it performs making open selection of both feed valves reverse the number of predetermined times.
[0007] Moreover, a control means is good to be made to carry out control to which memorize the contents of the last disconnection selection of both feed valves, and selection disconnection of the beginning of both feed valves is made to carry out from the memorized contents by next operation.
[0008]
[Function] According to the above-mentioned means, when connection of the connection hose to both the 1st and 2nd feed valves is mistaken, open selection of both [these] feed valves is made reverse, and supply of water and a molten bath comes to be performed correctly as a result.
[0009] Moreover, even if a control means performs making open selection of both feed valves reverse the number of predetermined times, when the water temperature in laundry sink does not become a predetermined change, in what was made to carry out control which carries out halt or abnormality information for operation, the supply which water and a molten bath mistook can be prevented more certainly.
[0010] Furthermore, a control means can memorize the contents of the last disconnection selection of both feed valves, and can lose certainly the error of supply of the water from next operation, and a molten bath much more in what was made to carry out control to which selection disconnection of the beginning of both feed valves is made to carry out from the memorized contents by next operation.

[0011]
[Example] Hereafter, it explains with reference to drawing 1 per example of this invention thru/or drawing 6 . The tank 1 of the whole washing machine is first shown in drawing 3 , and the agitator body 5 further for [in an inner lift 4] wash to a pars basilaris ossis occipitalis is arranged [the outside tub 2 for / sump] in the interior for two or more sets (only a lot is illustrated) of porous inner lifts 4 which it hangs, elastic support is carried out according to the rod device 3, and it arranges, are laundry sink in the outside tub 2, and are also dehydration tacks, respectively.
[0012] While arranging the drain valve 6 and exhaust hose 7 for draining out of the outside tub 2 (inside of an inner lift 4), are arranging the drive 9 which makes a motor 8 a subject, and control an inner lift 4 in the lower part section at the time of washing and a rinse, and he makes it rotate an agitator body 5 with this drive 9, and is trying to make it rotate an inner lift 4 with an agitator body 5 outside the outside tub 2 at the time of dehydration. Moreover, the rotational frequency sensor 10 which detects the rotational frequency of this motor 8 is arranged in the motor 8 of this drive 9. Furthermore, the temperature sensor 11 which functions as a temperature detection means to detect the water temperature in an inner lift 4 is installed in the outsole side of the outside tub 2.
[0013] On the other hand, the top covering 12 is arranged on a tank 1, and as shown in drawing 4 , the 1st feed valve 13 and 2nd feed valve 14 are put in order and installed inside the posterior part of this top covering 12. The end connections 13a and 14a of both [these] the feed valves 13 and 14 are projected to the method of outside after the top covering 12, as shown also in drawing 5 , and they can make now selection connection of the connection hose led from the faucet of the waterworks which is not illustrated, or the connection hose led to the list from the hot-water supply system. Moreover, the water or the molten bath which passed along both [these] the feed valves 13 and 14 is supplied in said inner lift 4 through the supply channel 15 established in the method of the inside of a posterior part of the top covering 12 in common.
[0014] And the microcomputer 16 is further arranged in the method of the inside of anterior part of the top covering 12. A detection signal is inputted [water] at least for the water which detects the water level in said outside tub 2 while the various switch signal from the various actuation switch 17 is inputted, as this microcomputer 16 functions as a control means and it is shown in drawing 6 from a sensor 18, further, a revolution-rate-detection signal is inputted from said rotational frequency sensor 10, and a temperature detection signal is inputted from a temperature sensor 11, respectively.
[0015] And based on the control program beforehand memorized by those input lists, a microcomputer 16 gives a drive control signal to the various indicators 19, the buzzer 20 for abnormality information, said 1st feed valve 13, the 2nd feed valve 14, a motor 8, and the drive circuit 21 that drives a drain valve 6.
[0016] So, below, the operation based on the function of the above-mentioned microcomputer 16 is described. As first shown in drawing 2 , required power is supplied and a microcomputer 16 detects the amount of washing to the beginning which the start switch was operated and started actuation (start) (step S1). Detection of this amount of washing is performed by detecting the rotational frequency of that motor 8 when carrying out predetermined time energization at the motor 8 of a drive 9, and rotating an agitator body 5 by the rotational frequency sensor 10, and since the burden of a motor 8 becomes large and that rotational frequency decreases so that there are many amounts of washing, it can perform detection of the amount of washing by detecting this rotational frequency.
[0017] subsequently, the 1st feed valve 13 and 2nd feed valve 14 are made [both] to open wide, and water is supplied in an inner lift 4 -- making (step S2) -- after that and water level -- the water level in the outside tub 2 is as lower as the water from a sensor 18 one step by the detection signal than "low-water level" -- "-- little -- water level -- " -- it judges whether it reached or not (step S3). At this step S3, if the water level in the outside tub 2 comes to be judged to have reached "about little water", the motor 8 of a drive 9 will be intermittently energized in the direction of a forward/reverse rotation by the pattern of for example, **** for 0.3-second energization-2.0 seconds, forward reversal of the agitator body 5 will be carried out, and the water in an inner lift 4 will be agitated with the washing (step S4).
[0018] Then, it is the water temperature T0 in an inner lift 4 by the temperature detection signal from a temperature sensor 11 in the place which judged whether the time amount for 13.8 seconds passed, for example (step S5), and was judged to have passed. It measures (step S6). In this case, although a temperature sensor 11 detects the temperature of the outside tub 2 directly, since the temperature of that outside tub 2 is what is influenced by the temperature of the water (molten bath) supplied in the outside tub 2, and the temperature of the water (molten bath) further supplied to the inner lift 4, it will detect the water temperature in an inner lift 4 as a result.
[0019] Carry out a deer and, at least as for water, at least the water from a sensor 18 judges after that whether it reached, about [the water level in the outside tub 2 basing detection of the amount of washing in previous step

S1 / "about setting water"] with a detection signal (step S7). While it is judged that it has not reached, it judges whether the water temperature in an inner lift 4 is for example, more than 33 [**] from the measurement result of the water temperature in step S6 (step S8).

[0020] It judges whether if the water temperature in an inner lift 4 is judged not to be more than 33 [**] at the above-mentioned step S8, the water temperature will be for example, below 27 [**] (step S9), and if it is judged that it is not below 27 [**], either, since water temperature is the optimal temperature below 27-33 [**], it will return to step S4. And at step S7, if the water level in the outside tub 2 comes to be judged to have reached "about setting water", the 1st feed valve 13 and 2nd feed valve 14 will be made [both] to blockade (step S10), and "washing" stroke will be performed after that (step S11).

[0021] On the other hand, if the water temperature in an inner lift 4 is judged to be more than 33 [**], the 1st feed valve 13 will be made to open wide, and the 2nd feed valve 14 will be made to blockade at step S8 (step S12). In this case, it is regular to connect to the 1st feed valve 13 the connection hose led from the faucet of a waterworks, and to connect to the 2nd feed valve 14 the connection hose led from the hot-water supply system, and if it has connected such, water will be supplied in an inner lift 4.

[0022] Then, the same churning as previous step S4 is carried out (step S13), the same elapsed time as step S5 is judged (step S14), and it is the still more nearly same water temperature T1 as step S6. It measures (step S15) and is that measurement water temperature T1 after that. Previous measurement water temperature T0 It judges whether it is low (step S16).

[0023] At this time, it is the present measurement water temperature T1. Previous measurement water temperature T0 If it is judged that it is low, it will be that measurement water temperature T1. T0 It replaces (step S17) and returns to step S7. It is judged that it comes out, and does not fall to falling usually coming out and water temperature having it, namely, the water temperature in an inner lift 4 carried out predetermined change and a different change. however, when it was judged that it was not low, the 1st feed valve 13 should be made to open wide in an inner lift 4, and water must have been supplied -- The 1st feed valve 13 is made to blockade contrary to previous step S12, and the 2nd feed valve 14 is made to open wide (step S18).

[0024] and replacement of the same measurement water temperature as after that and step S17 -- carrying out (step S19) -- the same water temperature T1 as the same churning (step S20) as step S4, decision (step S21) of the same elapsed time as step S5, and step S6 It measures (step S22) and the same measurement water temperature as step S16 is compared (decision and step S23 of change of water temperature).

[0025] A deer is carried out and it is the present measurement water temperature T1 at the above-mentioned step S23. Previous measurement water temperature T0 If it is judged that it is low water came to be correctly supplied in the inner lift 4 -- judging -- decision of the water level in the same inner lift 4 as step S7 -- carrying out (step S24) -- the water level -- a setup, while it is judged that it is not water level If the same water temperature as step S9 judges whether it is below 27 [**] (step S25) and is judged not to be below 27 [**] here, since water temperature is the optimal temperature below 27-33 [**] as mentioned above, it will return to step S19. And if water level comes to be judged to have reached "about setting water" at step S24, it will return to step S10.

[0026] In addition, it is the present measurement water temperature T1 at the above-mentioned step S23. Previous measurement water temperature T0 If it is judged that it is not low, it will return to step S7. Moreover, at step S25, if water temperature is judged to be below 27 [**], will make the 1st feed valve 13 as well as step S12 open wide, the 2nd feed valve 14 will be made to blockade, and a molten bath will be supplied in an inner lift 4 (step S26).

[0027] After the above-mentioned step S26 replaces the same measurement water temperature as step S17 (step S27). The same water temperature T1 as the same churning (step S28) as step S4, decision (step S29) of the same elapsed time as step S5, and step S6 It measures (step S30). After that, it is the measurement water temperature T1. Previous measurement water temperature T0 It judges whether it is above (step S31). And it is the present measurement water temperature T1 at the step S31. Previous measurement water temperature T0 If it is judged that it is above decision of the water level in the same inner lift 4 as step S7 -- carrying out (step S32) -- the water level -- a setup, while it is judged that it is not water level if the same water temperature as step S8 judges whether it is more than 33 [**] (step S33) and is judged not to be more than 33 [**] -- step S27 -- return and step S32 -- water level -- a setup -- if it comes to be judged that it is water level, it will return to step S10. Moreover, if water temperature is judged to be more than 33 [**] at step S33, it will return to step S18. Furthermore, it is the present measurement water temperature T1 at step S31. Previous measurement water temperature T0 If it is judged that it is not above, it will return to step S7.

[0028] In addition, by the above-mentioned step S9, if water temperature is judged to be below 27 [**], will make the 1st feed valve 13 blockade, the 2nd feed valve 14 will be made to open wide, and a molten bath will be supplied in an inner lift 4 (step S34). And the same water temperature T1 as the same churning (step S35) as

after that and step S4, decision (step S36) of the same elapsed time as step S5, and step S6 It measures (step S37) and the same measurement water temperature as step S31 is compared (decision and step S38 of change of water temperature). At this time, it is the present measurement water temperature T1. Previous measurement water temperature T0 If it is judged that it is above, it will progress to step S17. However, the present measurement water temperature T1 Previous measurement water temperature T0 If it is judged that it is not above It is judged that it comes out, it does not go up although going up usually comes out and water temperature has it, namely, the water temperature in an inner lift 4 carried out predetermined change and a different change. the 2nd feed valve 13 should be made to open wide in an inner lift 4 at this time, and the molten bath must have been supplied -- Progress to step S26, namely, the 1st feed valve 13 is made to open wide contrary to previous step S35, and the 2nd feed valve 14 is made to blockade.

[0029] thus, when change with which connection of the object for water supply to the 1st feed valve 13 and 2nd feed valve 14 and the connection hose for hot-water supply has mistaken by the thing of this configuration, and the water temperature in an inner lift 4 differs from a predetermined change is carried out Damaging the washing can also be avoided now, when supply of the water and a molten bath comes to be performed correctly as a result and sufficient wash effectiveness is acquired, since open selection of both the feed valves 13 and 14 is made reverse and supply of water and a molten bath is made on the contrary.

[0030] Drawing 7 and drawing 8 are what shows the example from which this invention differs to the above. If only difference with the above-mentioned example is described, it will be [step S17 back and] the present measurement water temperature T1 at step S23. Previous measurement water temperature T0 After it was judged that it was not low, It is the present measurement water temperature T1 at step S31 to a list. Previous measurement water temperature T0 Although it will return to step S7 if it judges whether open selection of both the feed valves 13 and 14 was made reverse (step S39) and it is judged that it is not made reverse after it is judged that it is not above Conversely, if it is judged that it carried out, it concludes that supply of water and a molten bath was not correctly performed even if reverse, operation is stopped (step S40), and it is in the place which a buzzer 20 is operated further and reports abnormalities (step S41) and which was made like. By doing in this way, the supply which water and a molten bath mistook can be prevented more certainly.

[0031] moreover, the case of this thing -- step S7 -- a setup, after it is judged that water level was reached It memorizes that open selection of both the feed valves 13 and 14 was right (step S42). on the other hand, the step S24 -- the same -- a setup -- the list after it was judged that water level was reached -- step S32 -- a setup, after it is judged that water level was reached It memorizes that open selection of both the feed valves 13 and 14 was reverse (step S43). After water temperature is judged to be more than 33 [**] at step S8 in next operation If open selection of both the feed valves 13 and 14 judges whether it was right (step S44) and is judged to have been right by storage of the above-mentioned step S42 Although it progresses to step S12, it will be made to progress to step S18 if it is judged by storage of step S43 that it was not right (open selection of both the feed valves 13 and 14 was reverse).

[0032] Also after combining and judging that water temperature is below 27 [**] in step S9 in next operation in this case If open selection of both the feed valves 13 and 14 judges whether it was right (step S45) and is judged to have been right by storage of the above-mentioned step S42 Although it progresses to step S34, it will be made to progress to step S26 if it is judged by storage of step S43 that it was not right (open selection of both the feed valves 13 and 14 was reverse).

[0033] That is, in this thing, the contents of the last disconnection selection of both the feed valves 13 and 14 are memorized, it is what was made to carry out control to which selection disconnection of the beginning of both the feed valves 13 and 14 is made to carry out from those memorized contents by next operation, and, thereby, the error of supply of the water from next operation and a molten bath can be lost certainly much more.

[0034] In addition, this invention is not limited only to the example which described above and was shown in the drawing, within limits which do not deviate from a summary, is changed suitably and can be carried out.

[0035]

[Effect of the Invention] The washing machine of this invention is a thing as explained above, and does the following effectiveness so. While equipping the 1st with a temperature detection means to detect the water temperature in the above-mentioned laundry sink in what equipped supplying water in laundry sink with the 1st feed valve and 2nd feed valve Disconnection of both the above-mentioned feed valves is chosen and performed. Each the water supply before and after water supply when the water temperature in laundry sink is judged to have carried out predetermined change and a different change from the detection result by the above-mentioned temperature detection means Also when connection of the object for water supply to both [these] feed valves and the connection hose for hot-water supply has been made reverse by having had the control means which makes reverse open selection of both the above-mentioned feed valves It is also avoidable to damage the

washing, when it can make it possible to perform supply of water and a molten bath correctly and wash effectiveness sufficient in regular order is acquired.

[0036] The supply which the above-mentioned water and a molten bath mistook can be more certainly prevented by having been made to carry out control which carries out halt or abnormality information for operation to the 2nd, when the water temperature in laundry sink did not become a predetermined change, even if the above-mentioned control means performed making open selection of both feed valves reverse the number of predetermined times.

[0037] To the 3rd, the above-mentioned control means can lose an error for supply of the water from next operation, and a molten bath certainly much more by memorizing the contents of the last disconnection selection of both feed valves, and having been made to carry out control made to perform selection disconnection of the beginning of both feed valves from the memorized contents by next operation.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] 2 of flow chart ** for operation explanation which shows one example of this invention
[Drawing 2] 1 of this flow chart **
[Drawing 3] The whole fracture side elevation
[Drawing 4] This fracture top view
[Drawing 5] Upside rear view
[Drawing 6] Outline electrical-and-electric-equipment block diagram
[Drawing 7] The drawing 2 equivalent Fig. showing the example from which this invention differs
[Drawing 8] Drawing 1 equivalent Fig.
[Description of Notations]
4 -- in an inner lift (laundry sink) and 11, the 2nd feed valve and 16 show a microcomputer (control means), and, as for a temperature sensor (temperature detection means) and 13, 20 shows a buzzer, as for the 1st feed valve and 14.

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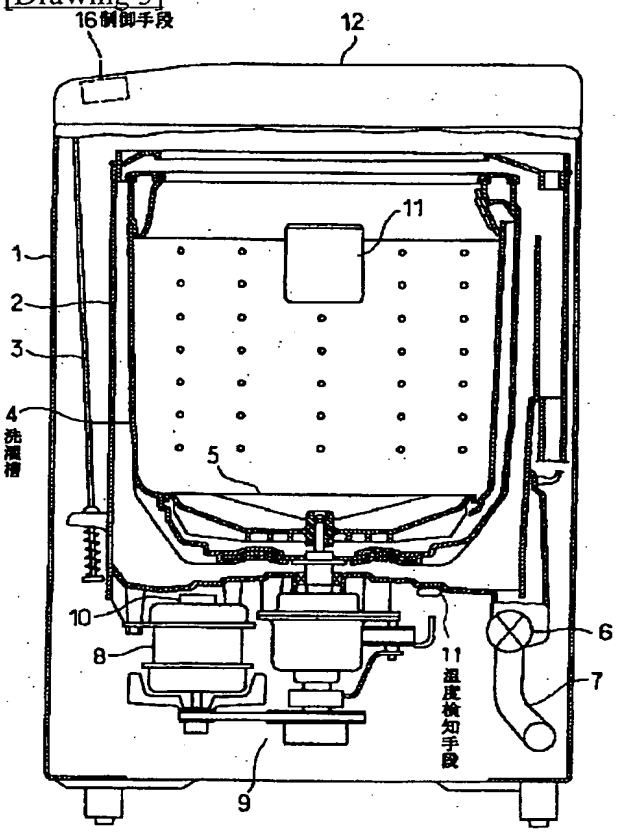
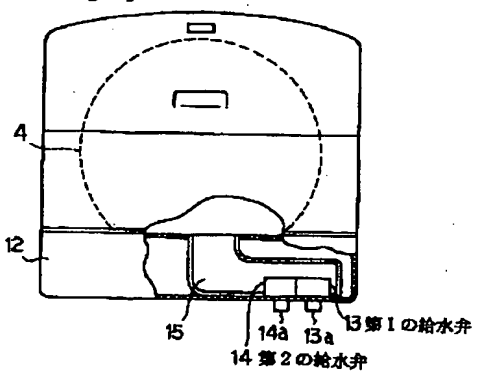
DRAWINGS

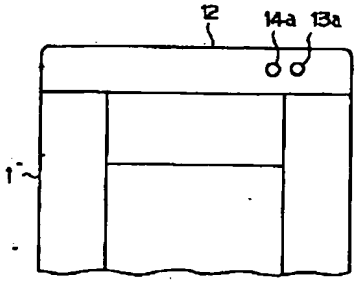
[Drawing 3]



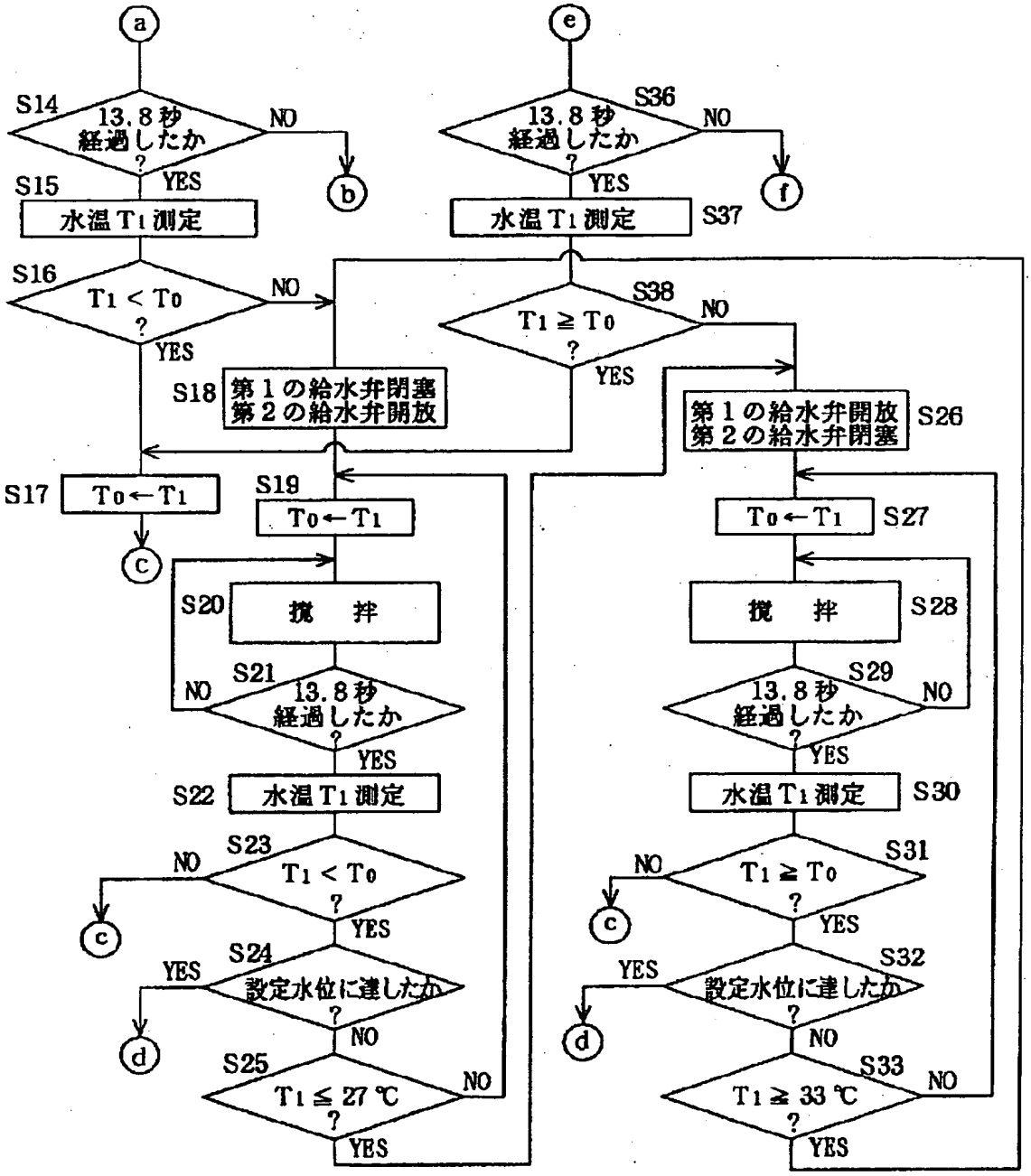
[Drawing 4]



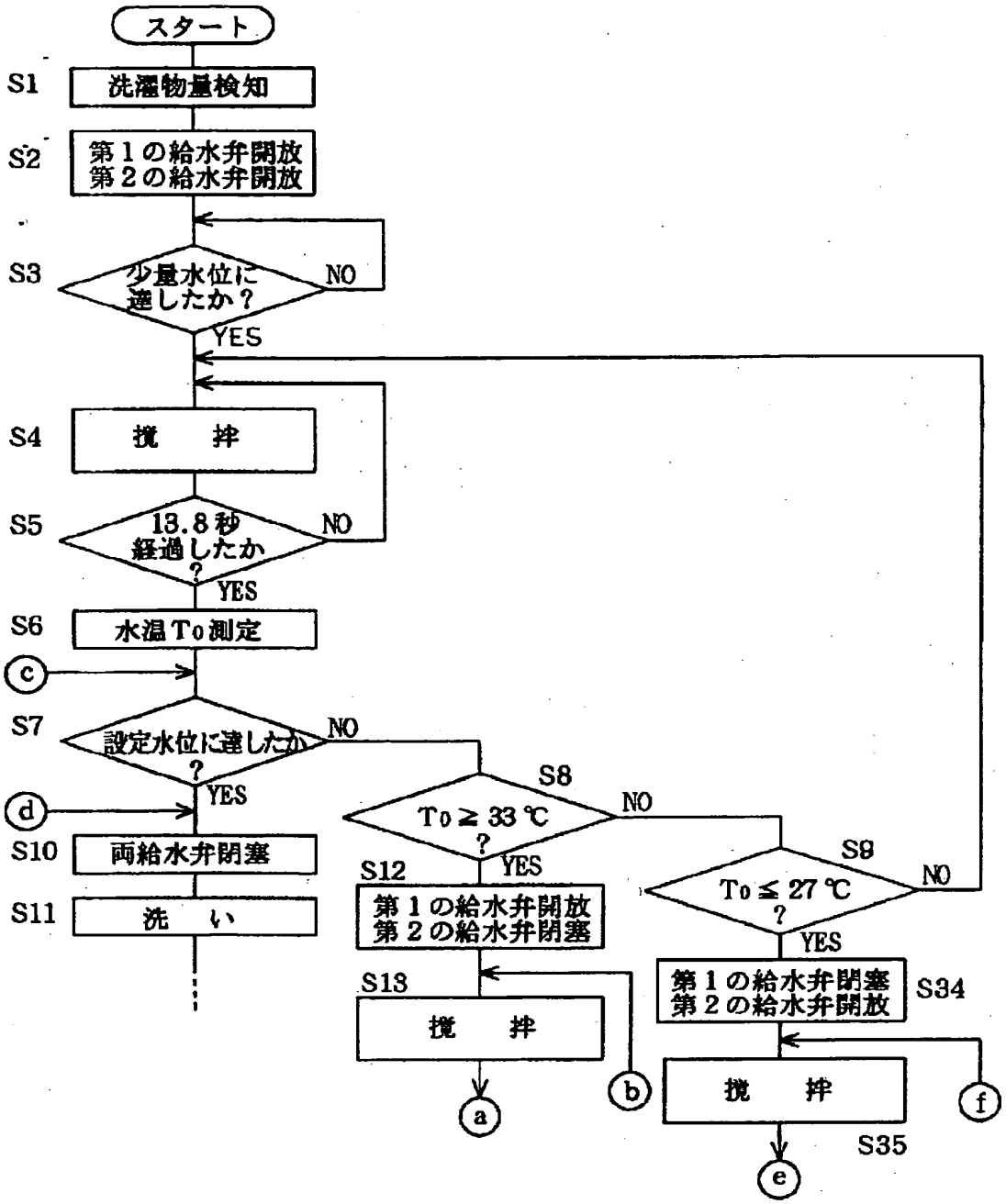
[Drawing 5]



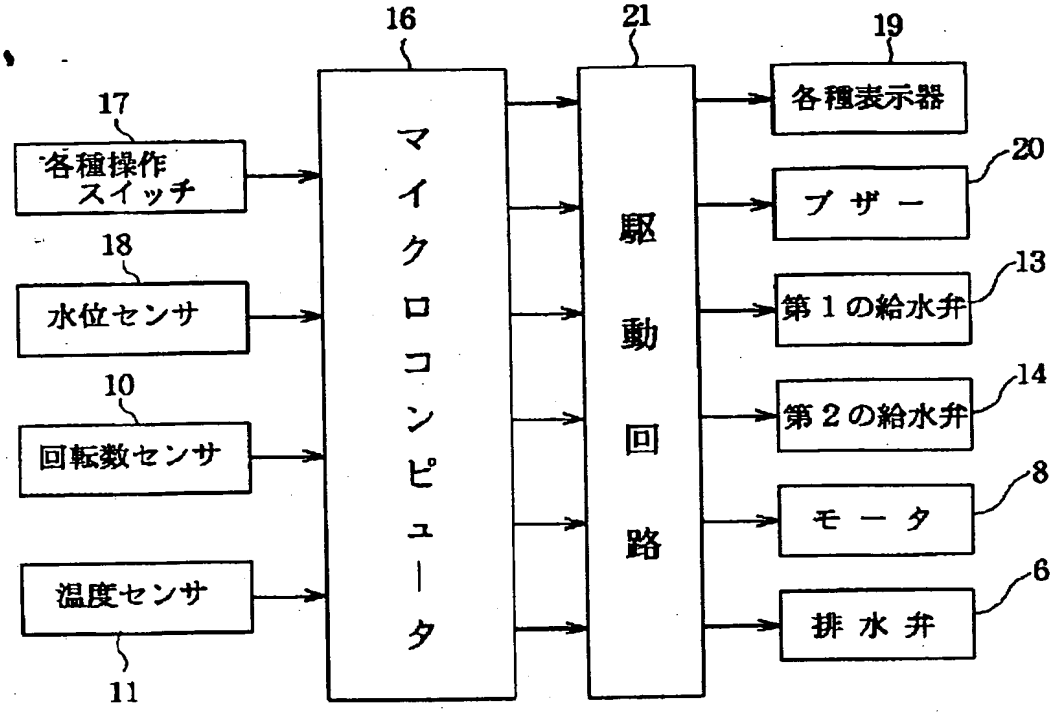
[Drawing 1]



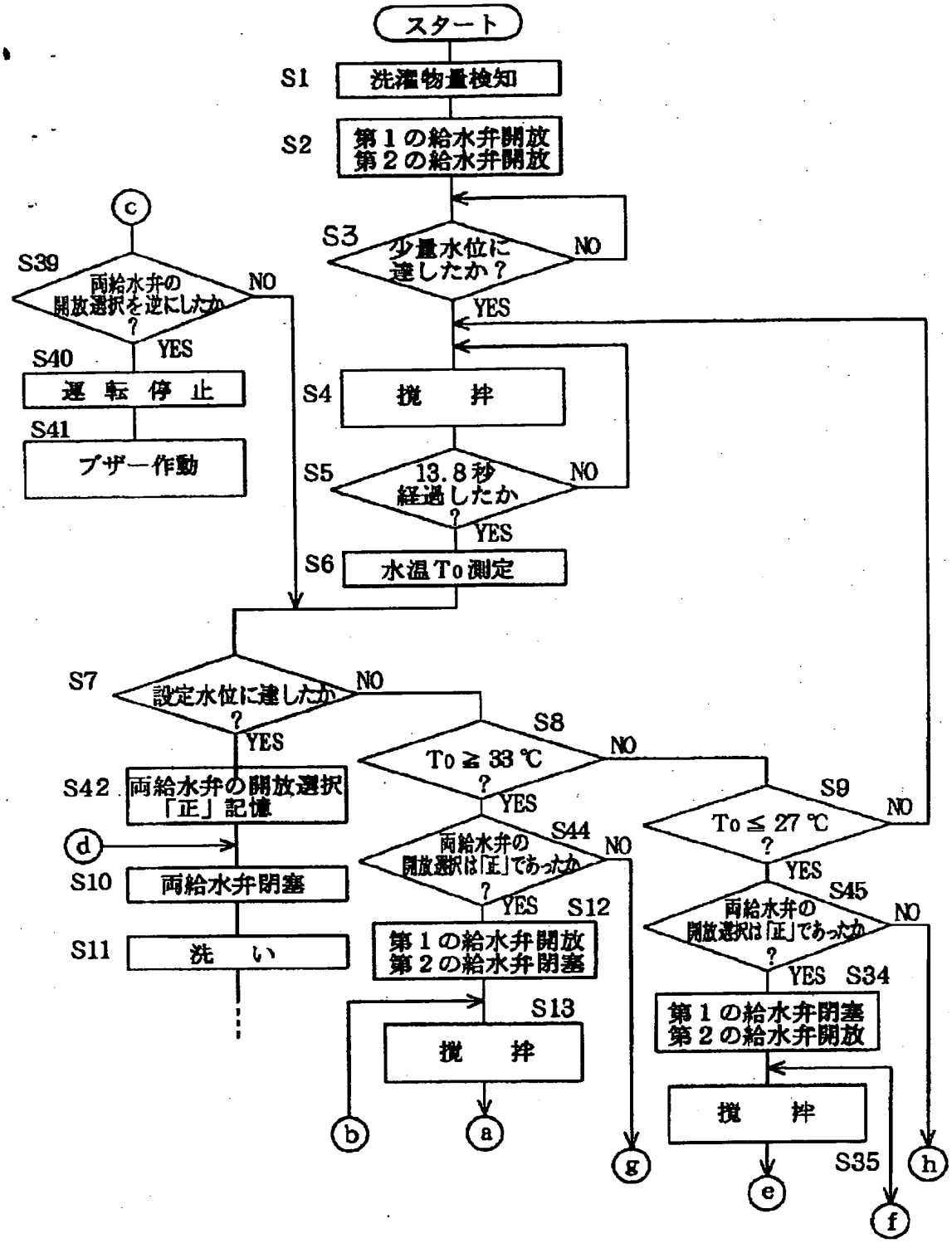
[Drawing 2]


スタート
S1
洗濯物量検知
S2
第１の給水弁開放
第２の給水弁開放
S3
少量水位に達したか？
NO
YES
S4
撹　拌
S5
13.8秒経過したか？
NO
YES
S6
水温To測定
c
S7
設定水位に達したか？
NO
YES
d
S10
両給水弁閉塞
S11
洗　い
S8
To≧33℃？
NO
YES
S12
第１の給水弁開放
第２の給水弁閉塞
S13
撹　拌
a
b
S9
To≦27℃？
NO
YES
第１の給水弁閉塞
第２の給水弁開放
S34
撹　拌
S35
e
f

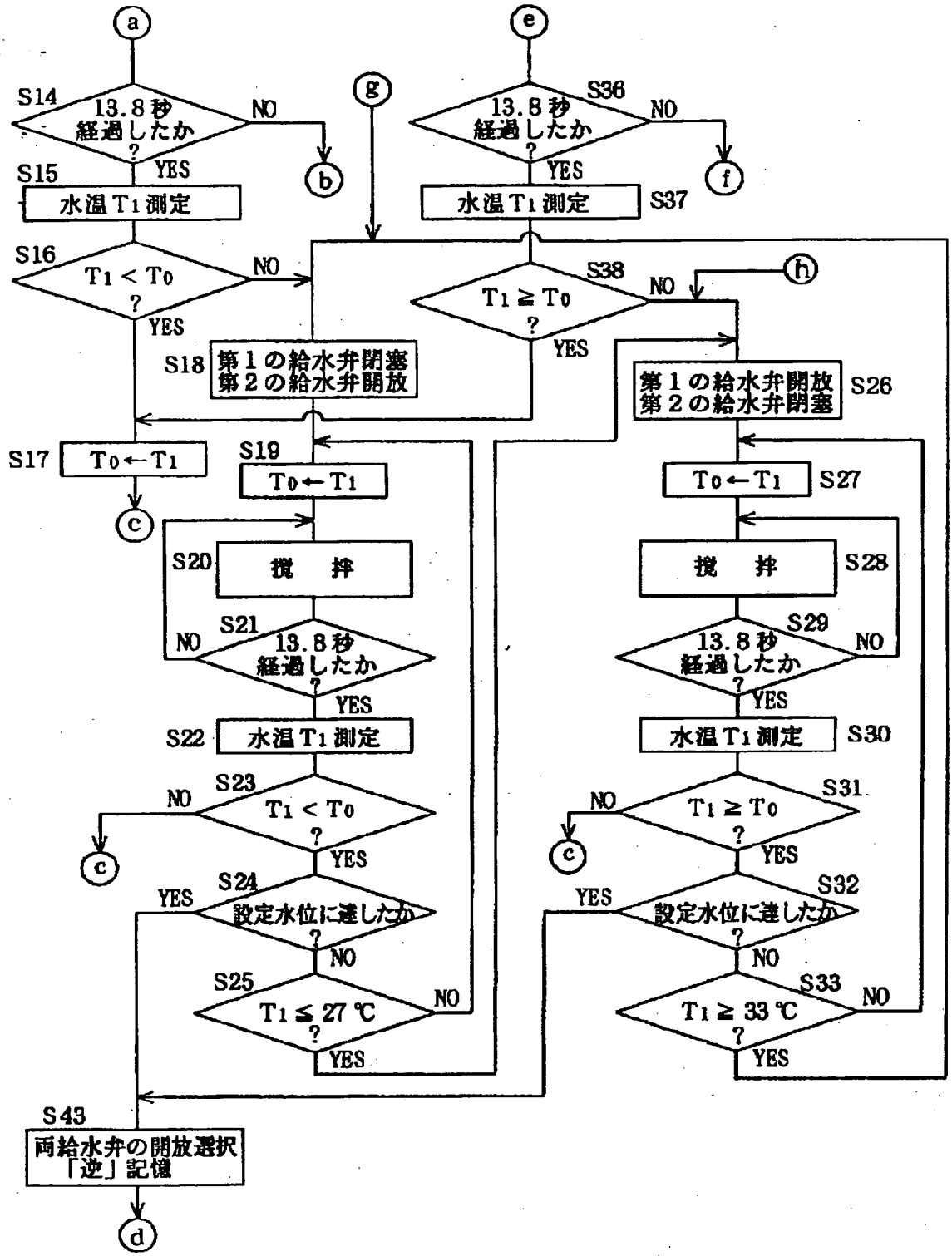
[Drawing 6]


16
21
19
17
各種操作スイッチ
18
水位センサ
10
回転数センサ
温度センサ
11
マイクロコンピュータ
駆動回路
各種表示器
20
ブザー
13
第1の給水弁
14
第2の給水弁
8
モータ
6
排水弁

[Drawing 7]


スタート
S1
洗濯物量検知
S2
第１の給水弁開放
第２の給水弁開放
S3
少量水位に達したか？
NO
YES
S4
撹　拌
S5
13.8秒経過したか？
NO
YES
S6
水温To測定
S7
設定水位に達したか？
NO
YES
S8
To≧33℃？
NO
YES
S9
To≦27℃？
NO
YES
S10
両給水弁閉塞
S11
洗　い
S12
第１の給水弁開放
第２の給水弁閉塞
S13
撹　拌
S34
第１の給水弁閉塞
第２の給水弁開放
S35
撹　拌
S39
両給水弁の開放選択を逆にしたか？
NO
YES
S40
運転停止
S41
ブザー作動
S42
両給水弁の開放選択「正」記憶
S44
両給水弁の開放選択は「正」であったか？
NO
YES
S45
両給水弁の開放選択は「正」であったか？
NO
YES
a
b
c
d
e
f
g
h

[Drawing 8]



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